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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Catalpa.—Forests of the White Mountains..... 533
Ornamental Fruits in the Pines.....*Mrs. Mary Treat.* 534
Cranberry Culture in New Jersey.....*Professor John B. Smith.* 535
A Bit of Forgotten History.....*Carl Bolle.* 536
Two Remarkable Catalpa-trees. (With figures.).....*Henry Brooks.* 536
FOREIGN CORRESPONDENCE:—London Letter.....*W. Watson.* 536
CULTURAL DEPARTMENT:—Rose Notes.....*E. G. Hill.* 538
Notes on Shrubs.....*J. G. J.* 538
Some Native Ferns.....*F. H. Horsford.* 540
Autumn Crocuses.....*E. O. Orpet.* 540
Vanda Sanderiana.....*John Weathers.* 540
Setting Strawberry Plants in Autumn.....*E. Williams.* 541
Grapes in Eastern Massachusetts.....*Benjamin G. Smith.* 541
A Dangerous Enemy to the Radish.....*Professor Byron D. Halsted.* 541
Adlumia cirrhosa.....*W. T.* 542
CORRESPONDENCE:—The Palms of the Southern California Border, *Samuel B. Parish.* 542
The Quality of Russian Apples.....*H. E. Van Deman.* 542
PERIODICAL LITERATURE..... 543
NOTES..... 544
ILLUSTRATIONS:—A Remarkable Old Catalpa-tree, Fig. 68..... 537
The Catalpa-tree (*Catalpa bignonoides*), Fig. 69..... 539

The Catalpa.

THE genus Catalpa is eastern American and eastern Asiatic in the distribution of its species. Two of these occur in North America, one in the West Indies, one in Japan and one in the northern regions of China. They are all trees with ample, generally opposite, simple leaves, large terminal panicles of showy flowers, and long, slender, nearly cylindrical capsular pods. The flowers, which appear in all the extra-tropical species in early summer, are characterized by the deeply two-lipped calyx, the irregularly two-lipped, bell-shaped corolla, which is white and conspicuously marked with purple and yellow in the throat, and by two, or rarely four, fertile, and one to three sterile, rudimentary stamens. The capsule is divided into two cells by a partition which is at right angles to its valves. The seeds are numerous and densely packed in the cells of the pod; they are furnished on each end with long, papery wings, cut at the extremity into delicate white fringe.

The familiar species, and the type of the genus as it is now constituted, is *Catalpa bignonoides*, the Catalpa-tree or Indian Bean. It is a low, wide-branched tree, with a short, stout trunk covered with thin, pale, furrowed bark. The wood, like that of the other species, is light brown, and contains numerous large open ducts, which mark the layers of growth. The wood of all the species is remarkable for the thin sap-wood, which consists of three or four layers of annual growth only. The leaves, which emit a disagreeable odor when crushed, are cordate at the base, somewhat acuminate, and are occasionally provided with a pair of salient lateral teeth. They are light yellow-green in color, and do not unfold until nearly all other trees are covered with foliage. The flowers open at the north late in June or during the early days of July; they are produced in very large, compact panicles, and are about an inch or an inch and a half long. They are peculiar in their campanulate corolla, with an oblique limb and entire lower lobe. The inner surface is thickly covered with purple spots and is streaked with yellow.

This tree has much to recommend it as an ornament for the garden. It is hardy; it grows rapidly; it is not very particular about soil, and insects do not prey upon its foliage. The large, brilliant leaves have an almost tropical appearance, and the flowers, which appear late in the season, when flowers are particularly valuable, are produced in the greatest profusion. There are few trees, certainly, of temperate regions which present a more remarkable floral display than a large Catalpa-tree in full bloom. These qualities have made the Catalpa one of the most popular trees in all the temperate regions of the world; indeed, it has been cultivated so long, and has now become so completely established in many parts of the southern states, that it is not easy to determine exactly where it grew before man carried the seeds from one part of the country to another.

The Catalpa appears to have been first made known to Europeans by Mr. Mark Catesby, the English naturalist, who was in our south Atlantic regions early in the last century and who is remembered by his handsome "Natural History of Carolina," which appeared in London in 1731. He published an excellent figure of the tree, which he says was unknown to the inhabitants of the settled portions of Carolina until he introduced it from the remoter parts of the country. What Catesby meant by the remoter parts of the country is not clear; but it is hardly probable that he ever penetrated more than one or two hundred miles from the coast, and certainly he never crossed the mountains into the region which is now generally regarded to have been the first home of this tree—south-western Georgia, and central Alabama and Mississippi. It is probable, therefore, that the Catalpa was first brought east of the Alleghany Mountains by the Cherokees, who are known to have been somewhat interested in plants, and that it was from their cultivated trees or their offspring escaped to the forest that Catesby obtained the plants for the Carolina planters and for his English correspondents, to whom he sent the Catalpa as early as 1726. Even to this day there is doubt in regard to the true home of the species. It may be seen growing on the banks of the upper Apalachicola and Flint Rivers in south-western Georgia, so remote from existing habitations that it is difficult to imagine that the seed which has produced these trees could ever have been blown from cultivated plants. Still, it is impossible to surmise how far a plant provided with seed so admirably adapted for transportation by the agency of the wind can eventually be carried from an original starting point; and the fact that the Catalpa is hardy so far north, and that it has even become naturalized in some parts of Pennsylvania, seems to be an indication that its true home is not in the hot, low, semi-tropical country of the Gulf states, but rather in some still unexplored mountain region of the Appalachian foot-hills, from which it was early carried by the Indians east into Carolina and south-west into Georgia and Alabama, through which states and beyond it has gradually spread until it is now found over a large area of the middle and southern states.

Two well marked varieties, at least, of this tree have appeared. The first, the so-called Golden Catalpa, has bright yellow foliage. The second is a dwarf, compact shrub rarely attaining a height of six feet, but spreading widely, and thickly covered with leaves. This curious plant, which is not known to have produced flowers, passes universally in nurseries as *Catalpa Bungei*, although it has nothing to do with the Chinese species of that name. It is sometimes grafted as a standard on tall stems of the Catalpa, and, grown in this fashion, it makes a small tree with a compact round head, useful for the decoration of small gardens and city squares.

The second North American Catalpa, *C. speciosa*, was distinguished specifically a few years ago by the late Dr. J. A. Warder, a Nestor among American tree-planters in the west. It is a native of the river-swamps which abound about the mouth of the Ohio and the adjacent parts of Missouri. Dr. Warder's attention was directed to some Catalpa-trees planted in the streets of an Ohio town, and found that they grew more rapidly than other individuals planted

with them, and that they assumed a more upright manner of growth. He found, too, that the ends of the branches of these trees were not killed in winter, as was the case with many Catalpa-trees, and that they flowered fully two weeks earlier; that the flowers were considerably larger, and were produced in shorter, fewer-flowered panicles; and that the pods were much larger and nearly twice as thick. These observations led him and several botanists to study these peculiar trees, and it was found that the western Catalpas all differed in these respects from the trees which had been ordinarily cultivated in the eastern and southern states, and that instead of one, North America could boast of two species. It was found, and this is probably true of all the species of the genus, that the wood of *C. speciosa*, although not hard or very heavy, possessed the power of resisting decay in a remarkable manner when placed in contact with the soil. It was found, too, that the young trees grew with astonishing rapidity, and were hardy as far north certainly as the forty-second degree of latitude, and could support the climate and high winds of the western prairies. These were qualities which western planters were in search of, and nurserymen at once set about raising the western Catalpa in great quantities. It has so far proved to be all that was expected of it, and millions of these plants have already been planted in the United States, especially in the west.

The other American species, *C. longisiliqua*, is a large forest-tree widely distributed through the West Indies, where it is prized for its hard, handsome wood, used in cabinet-making, and known as Spanish oak.

The Japanese Catalpa, *C. Kæmpferi*, is a smaller and less beautiful tree than either of its North American relatives. It has darker green foliage, smaller and less showily-colored flowers and slender pods. It is no longer a rare plant in American gardens, where it grows rapidly, flowers and fruits profusely, and is perfectly hardy as far north certainly as eastern Massachusetts. An interesting hybrid between this and one of the American species, described in this journal last year (ii., 303), has appeared. It is remarkable in characters intermediate between its two parents, in its hardness, and in its vigorous and rapid growth.

The second Asiatic species, *C. Bungei*, which must not be confounded with the plant found in nurseries under that name, is a native of northern and central China. It is a large tree, with smaller flowers and leaves than those of the American species, and is not yet known in cultivation either in the United States or in Europe. It may be expected to thrive where the Ailanthus will grow; and its introduction into our plantations has long been desired by American dendrologists, who have sought in vain to secure a supply of seeds of this interesting tree.

The illustrations in the present issue display the appearance of *Catalpa bignonoides* as a cultivated plant, and show the unusual method adopted by an old specimen to extend itself by means of rooting branches. Our readers are referred to the account of these venerable trees printed on page 536. It is from the pen of the great-grandson of the man who planted them, and whose descendants down to the fourth generation have been able to watch their growth—an unusual and noteworthy occurrence in this country, where homes are rarely handed down beyond the second generation, and where the children of more than two generations rarely play beneath the shadow of the same trees.

A correspondent of *The New York Journal of Commerce* writes from the White Mountains that he was recently surprised by sounds like distant thunder, which rose at intervals above the steady roar of the October wind in the woods. He was led to make inquiry as to these repeated mutterings and this is what he learned:

Some miles down the valley is one of those glorious mountain torrents which are, or ought to be, the pride of New Hampshire. It comes out of a gorge in the hills, leaping from the shadows of the old forests into the open light of the valley, with more of spirit and freshness than perhaps any other of all the New Hampshire mountain streams. I am told that the sounds I have heard are the explosions of dynamite and giant powder, wherewith men are blasting out the rocks in this wild river, reducing its freedom to canal-like regularity, so that hereafter the forest-trees which are the glory of Mooseilauke can be cut and sent down stream to market. We have no right to quarrel with the men who are doing this. They own the forests and they own the river, and no one expects them to make a donation of their lumber and their river to the public. But it is now of most pressing importance that the State of New Hampshire should exercise its right of eminent domain and purchase these forests and streams and preserve them. The work of destruction is going on all around the mountains. Timber railroads have been pushed up to and into the ravines on the south and north sides, and now the streams, which, when the destroying work is complete, will cease to flow, are to be compelled by the forces of dynamite to become their own destroyers.

No, we cannot, under ordinary circumstances, complain when a man cuts the timber from his own land, even when he cuts it wastefully. But the forests of the White Mountains have a value beyond the market price of all the lumber they contain, and the wild White Mountain streams have a value beyond their capabilities of floating that lumber to market after they have been subdued to the logger's use. Apart from the function of these mountain forests in regulating the flow of the streams which take rise among them, their highest productive value lies in the charm they lend to the scenery. Even from a material point of view the loss to the state of New Hampshire which the defacement of this scenery would cause, by robbing the region of its attractiveness to tourists, would be incalculable. The native beauty and sublimity of the White Mountains are a source of revenue which will increase indefinitely with an increasing tide of visitors, and it is a short-sighted business policy, not to speak of other considerations, which permits so productive an inheritance to be squandered.

Ornamental Fruits in the Pines.

FOUR species of Ilex are now showing their ornamental fruits in the Pines. The Holly (*Ilex opaca*), with its fine foliage, sharp and spiny, and its scarlet berries, is handsome all winter. So is the Inkberry (*I. glabra*), with black fruit and shining smooth leaves. Both are abundant, the latter in all damp places. And the Black Alder or Winter-berry (*I. verticillata*) is everywhere in the swamps and bogs, and still holds its foliage, while the twigs are encircled with masses of bright red berries. Later the leaves will fall, but the berries will remain all winter. The Smooth Winterberry (*I. lævigata*) is also here, but not so abundant as the other species. The fruit ripens earlier and is larger than that of the Black Alder, and is now very bright and showy.

The clustered red fruit of the Flowering Dogwood (*Cornus florida*) is more beautiful than the flowers, and almost as showy. Another species of Cornus (*C. sericea*) which grows in wet places has pale blue fruit in flat cymes. This also is quite ornamental. And *Viburnum pubescens* is here, too, with flat cymes of dark purple fruit.

A cluster of the fruit of the Sassafras is very pretty. A fleshy red stem supports the blue berry, making it quite unique. The berry has a sharp, pungent taste, more concentrated than the bark of the root.

The cone-like fruit of *Magnolia glauca* is handsome in all of its stages. At first it is green, and as it matures it takes on yellow and rosy pink hues, and when fully matured the carpels split open and reveal the beautiful coral red, berry-like seeds, which soon drop out of their places, and are held in check by spiral threads which unroll and hold the dangling seeds suspended all around the cone.

Thick tangles of Smilax impede our progress. These thickets are terrible, almost impossible to penetrate to any distance—a tangled confusion of vines climbing over shrubs and trees, armed with sharp, stout prickles. But the vines hold pretty clusters of fruit, and one species has coral red berries, but most bear black fruit, some with a bloom like that of the grape, others with shining black berries. A difficult genus it seems to me, all mixed up and as hard to identify as it is difficult to penetrate the thicket.

Above these thickets, growing on old Sweet-Gum-trees, are clumps of Mistletoe, with clusters of pearly white berries.

And the Sweet-Gum has attractive fruit, also—spherical heads suspended by long pedicels on naked twigs, mostly persistent, swaying in the wind throughout the winter. And here is the Ampelopsis, a flame of color, clinging to the rugged trunks of the Gum-trees, and holding clusters of bluish black fruit in reserve for winter feasts for the bluebirds and robins, whose winter quarters are in the great Cedar-swamps of the region.

And the Cedars are now adorned with pretty, berry-like fruit, covered with a glaucous bloom of pale blue. The covering of the seeds is sweet and nice to the taste, and is highly relished by many birds, especially by bluebirds and robins.

The Climbing Bitter-sweet (*Celastrus scandens*) is now displaying its scarlet seeds here and there in the Pines. I found one clinging over an old Cedar-tree which made a charming picture and gave me a hint to go and do likewise in my garden, a result easily accomplished, as both the Cedar and the Bitter-sweet were already there. Not far from this Bitter-sweet the Virgin's Bower (*Clematis Virginiana*) had formed a pretty bower by climbing over some bushes, and, not content with these, it had reached up to a tree, where it displayed its feathery white tails in conspicuous clusters. At a little distance these feathery appendages of the seeds looked like a mass of white flowers.

The Sumach (*Rhus copallina*) is now quite ornamental both in foliage and fruit. The fruit is a dense crimson colored panicle, extremely acid to the taste. And the terrible poison Sumach (*R. venenata*) looks handsome with its scarlet foliage and drooping panicles of white fruit, which I can only admire at a safe distance.

We find plants of the Wax Myrtle (*Myrica cerifera*), with branches almost covered with the white waxy seeds. The foliage and fruit are both fragrant, making it a desirable addition to our ornamental collection. And the Wild Rose hips are abundant and almost as pretty as the flowers. And there are many dry fruits, especially in the Heath family, whose seed-pods are ornamental, such as Andromeda, Leucothoë, Azalea and others.

Turning our attention to the ground, we find in places that it is almost covered with the aromatic Wintergreen, with clusters of sweet, spicy, red berries. And the Partridge-vine (*Mitchella repens*) is creeping around old decaying stumps, showing its twin scarlet berries. And the Wild Cranberry is trailing about in the moss with crimson fruit sour enough to set one's teeth on edge; but the long sprays, covered with small evergreen leaves, and the bright berries, are very ornamental.

Vineland, N. J. *Mary Treat.*

Cranberry Culture in New Jersey.

IT often happens that the same crop is profitably grown in different places under different systems of cultivation, and many Cranberry-growers in New Jersey claim that Cape Cod methods are not the best—for New Jersey. I have spent part of two seasons on bogs of the Cape, and have spent a good deal of time for several years past on New Jersey bogs, primarily studying the insect enemies of the Cranberry, but with an eye also to methods of culture. Cape Cod methods are well described by Professor Bailey in the paper quoted in GARDEN AND FOREST (page 511), and perhaps a few words on New Jersey methods, inasmuch as they differ, may prove of interest. The bogs to be cultivated do not differ very essentially from those of the Cape-Cod region. A peat bottom is preferred, and the land once located, dams enough are built to flow it, and the water is left on for a year to kill off the bulk of the vegetation. This is then cut, the brush is uprooted and carried off and the ground decently cleared. The Cape Cod grower would thoroughly remove all stumps, level his bog carefully and sand heavily. This practice has been quite generally followed in New Jersey until a few years ago when some large growers claimed that sanding was unnecessary, and the vines are now generally planted in the mud. Where the vegetation has been killed by flooding, holes are punched in the decaying mass, and vines are set as described by Professor Bailey. It has been noticed that the heaviest crop of berries is borne by vines surrounding stumps, and these are now left in the ground to decay naturally. Ditching and draining are done as on Cape Cod, and old mill-ponds have become favorite sites for bogs.

This method of setting out a bog costs very much less than the Cape Cod method, and the result in looks is very much inferior. The vines, however, grow excellently well, better, indeed, most growers now say, than in sand, and the runners strike root as readily in the mud as they could in any other soil. The weeds are a nuisance, and here our eastern friends have the advantage, for they are more easily controlled in the sand. However, as the vines cover the ground they drive out most of the other plants, and the stubborn fighters, like Ferns, Sedges and Briars, are gradually exterminated. Some fine Grasses are not meddled with at all. They do not seem to prevent the growth of the vines, and, in fact, are considered rather a benefit, since these grassy patches bear the largest and safest crops. They are less liable to "scald"—the Jersey grower's most dreaded enemy—and they seem protected from many of the climatic difficulties which afflict their cleaner neighbors. A New Jersey bog is never as clean as the Cape bogs, nor usually even as clean as they should be. They bear quite as heavily, however, and after all that is what the farmers are looking for. In the east vines are kept short and re-sanding is done every few years. In New Jersey vines are often allowed to grow until they form a mat a foot thick, and individual vines may be several feet long. In some seasons these vines bear enormously; but they are not so safe for an annual crop as shorter vines. Instead of sanding, many growers mow the vines when they become too rank and so get a new and vigorous growth from old roots.

New England has perhaps the oldest cultivated bog-land, but there are many old bogs in New Jersey as well. Farmers are not entirely exempt from all human weaknesses, and some years ago, when the conviction prevailed that cranberries were a sure road to wealth without much work, Cranberry-land rose enormously in value, and all land was Cranberry-land if it was only in a Cranberry-region. Vines were planted on hill-sides, in sand-holes, in swamps, everywhere in fact. The inevitable reaction came. Insects and other pests eliminated the badly placed plantations and others were abandoned from want of knowledge. I have tramped in rubber boots over bogs on which thousands of dollars were spent which never yielded a dollar, and which now are so overgrown with brush as to leave no trace of cultivation. Naturally, New Jersey is much more favorably located for Cranberry-culture than Cape Cod. Our land is at least equally good, and our seasons are longer. We do not fear frost as early, and our vines get an earlier start. There is not that necessity for looking to early maturity in the berry which has made the Early Black the favorite on the Cape. For color and appearance the Early Black eclipses the ordinary New Jersey berry; but the latter is fully as good in flavor, makes just as good sauce, and has the enormous advantage of keeping well. New Jersey growers usually count on giving the east the early market, sending in only their dark varieties, which sell as Cape Cod berries and at the same price. The bulk of the crop is housed in special cranberry-houses, in which the berries are so packed as to season thoroughly. When Cape Cod berries are out of the way our berries take the market. The color is good, the fruit is usually sound, there is no undue competition, and the berries bring whatever the market will stand.

In describing the separation of berries, Professor Bailey does not refer to "bouncing." In picking late, or over scalding bogs, some soft berries will get into the boxes. To eliminate these, the berries are poured over an inclined screen and allowed to drop on a smooth board, beyond which is the receiver. The sound berries come down with a rush, strike the smooth surface and bound into the receiver. The soft berries come down with a thud, but have no "bounce" in them, and remain on the board, swept off at short intervals by the screeners.

Thus Cape Cod and New Jersey produce the same fruit by quite different means of cultivation; but they are not competitors, for while the Cape has looks and flavor it must sell early, as the fruit does not keep well. New Jersey sells its dark berries as Cape Cod fruit, and keeps its best until the eastern berries are gone and then supplies the market according to demand.

Of late years our growers have paid more attention to developing varieties, but, while they look after size and color, they retain keeping quality as an essential, and the varieties are still too little fixed or cultivated to merit notice here.

The systems of picking are different in New Jersey from those in use on the Cape, but that does not prevent their getting in the berries as effectually.

Rutgers College. *John B. Smith.*

I insist upon it that a plan complete in every detail should be adopted at the beginning and followed throughout. To be sure, in certain circumstances I should not hold to this latter point; for, given a fixed leading idea, the artist, during the progress of the work, ought to feel himself free to study his materials anew, . . . to modify his ideas of the details, or even to abandon them wholly or in part in case better ideas should come to him.—*Pückler-Muskau.*

A Bit of Forgotten History.

OUR valued correspondent, Herr Carl Bolle, of Berlin, recently published in *Gartenflora* an interesting article called "When Did the Weymouth Pine First Appear in Europe?" Weymouth Pine is the name commonly given in Europe to our White Pine (*Pinus Strobus*), and records the well ascertained fact that it was first made generally known in Europe by Lord Weymouth at the beginning of the last century. Specimens were brought to England in 1705, and almost immediately Lord Weymouth devoted himself to the cultivation of the tree, which from that day to this has been extensively planted in different parts of central Europe.

Herr Bolle has no wish to strip the memory of Lord Weymouth of the credit which thus attaches to it. His object is simply to show that, although this nobleman first popularized the White Pine, it had, contrary to the common belief, been seen in Europe much earlier. On general principles, he explains, it is unlikely that its importation can have been so long delayed, for other North America conifers had been introduced much sooner, as, for instance, the Bald Cypress before 1640 and the Red Cedar before 1664. Moreover, there is actual evidence of an early although merely passing attempt to cultivate the White Pine in Europe.

The first modern scientific treatise on conifers is the *De arboribus coniferis, resiniferis aliis quoque nonnullis sempiterna fronde virentibus*, which appeared at Paris in 1553, and was written by Pierre Belon, a physician and a traveler of wide experience. In this book, in the chapter headed "Pinaster," there may be found, suggests Dr. Bolle, a sure indication that *Pinus Strobus*, as well as *Thuya occidentalis*, were already growing in at least one garden of France. Inspired by the maritime achievements of the Spanish and Portuguese, and attracted by the rich fishing grounds of our northern coasts, French explorations of America began early in the sixteenth century. Even sailors were interested by the immense and varied forests of our coast regions, and, although botanical knowledge in the modern sense had hardly yet been born, there was everywhere in Europe a keen desire to find new plants with medicinal virtues. It is recorded that a disease which afflicted, among other less popular patients, Pope Leo X., Francis I. and Ulrich Von Hutten, was treated with a medicine in which sarsaparilla was mingled, with a decoction from the "Canadian Tree-of-life" (*Arbor vitæ*) and other exotic extracts. At this same period navigators were bringing from Canada great packages of a white, very light wood, somewhat spongy in texture and still covered with its bark. This they grandiloquently called the "second Tree-of-life," loudly praising its medicinal properties. After investigating it, Belon pronounced it useless, and, indeed, harmful, as likely to supersede really valuable medicaments. He expressed amazement that other physicians should have allowed themselves to be deceived by impostors to such a point that they had in their turn imposed upon even King Francis himself, and declared the high-priced stuff to be merely "Pinaster wood." By this name is not to be understood what we now call Pinaster, *Pinus Pinaster*, the tree which grows so plentifully on the *landes* of south-western France. But Belon's Pinaster, says Herr Bolle, was a tree which he thoroughly understood and has accurately described—*P. Cembra*, the familiar Pine of Switzerland, and long supposed to be the only European Pine whose leaves grow in groups of five. Misled by the arrangement of the leaves and by analogies of habitat, Belon seems to have thought he recognized this tree again in a small cultivated specimen which was shown him as having grown from seed in one of the royal gardens at Fontainebleau. His description runs as follows: "At Fontainebleau there stands, with evergreen needles, a little Pinaster-tree. When I saw it I recognized it as such at the first glance, by its stem as well as by its branches, its bark and other signs. This specimen has reached man's estate in five years. Its branches stand around the stem in just the same arrangement as on the Spruce and the Fir (*sapino et abieti*), cross-shaped at regular intervals. It has leaves like the Pine but thinner; these stand in bunches, sheathed below in a tube, five or six together and perpetually green. The carefulness of Mother Nature is unmistakably proved by the manner in which this tree buds in spring. That is, it develops five buds (shoots?) at the end of each twig, the central one of which is larger than the lateral ones. From this there then develop further leaves and fruits. By comparing the description of this tree with the tree native to our mountains their identity will be recognized. The specimen at Fontainebleau has not yet borne fruit." Belon then adds that he had collected seeds of *P. Cembra* in Savoy, and obtained plants from them which were identical in appearance with the little tree in the king's garden. To-day, comments Herr Bolle, every cultivator is familiar with the great resemblance between young plants of *P. Cembra* and of *P. Strobus*. "Nothing is more pardonable than to confuse the two." The little exotic stood unique at Fontainebleau, where, as is well known, the true "Tree-of-life" of the North American provinces was cultivated. By comparison with this it continued to be called the "second Tree-of-life" (*altera arbor vitæ*), probably on account of the fact that their common origin was known, although not specially dwelt upon.

It thus seems probable that it was a White Pine which Francis I. possessed in a living state. Those who question the fact, says Herr Bolle, should consider that Belon's phrase, "thinner" or "very thin leaves" (*folia exiliora*) does not apply to *P. Cembra*, but does in the most decided way to *P. Strobus*.

There were other enthusiastic horticulturists in France at that period who loved to crowd their gardens with novel exotics. But in no record of their collections can the slightest indication of the presence of *P. Strobus* be found. The little tree of Francis I. must have soon disappeared without leaving trace or seed behind. And though the Hollanders, who so long possessed large portions of our country, may well have sent specimens of this striking Pine home to the impassioned horticulturists of their mother-land, no statement of the fact can be found. Pierre Belon's description of the *altera arbor vitæ* at Fontainebleau is the only proof we have of the existence of *P. Strobus* in Europe prior to 1705. But in Herr Bolle's opinion this is enough to carry back the European story of the tree a century and a half beyond the commonly accepted date.

Two Remarkable Catalpa-Trees.

THE tree shown in the illustration (Fig. 68, p. 537) is a Catalpa (*C. bignonoides*), and one of two trees growing on the old P. C. Brooks place in West Medford, Massachusetts. These trees were set out on April 24th, 1809, and owing to their favorable situation have attained a remarkable size. They stand on the south side of the house and are well protected from the winds in winter. Two spouts conduct the water from a large portion of the roof directly to the roots. The tree shown in Fig. 68 is the more interesting of the two. The trunk is nine feet eight inches in circumference at four feet from the ground; it is about forty feet high and has a spread of fifty feet. At four feet from the ground four branches radiate from the trunk, two of which, on the south side of the tree, drop toward the ground until they touch it, and at this point they have rooted and thrown up four or five young shoots, two of which are over three feet in circumference at two feet from the ground. This first rooting of the limbs is but ten feet distant from the stem. The trailing branches extend in various directions over the turf from these first two clumps of shoots, throwing up shoots like huge suckers wherever the old limbs have rooted until a small forest of young Catalpas has been formed under the shade of the parent tree. There is no record of when this peculiar habit first developed, but it must have been many years ago. All the limbs that connect the young tree to the main trunk have been dead for many years, but the wood is still perfectly sound.

The second tree (Fig. 69), standing to the eastward of the one described above, although not so interesting, is a large Catalpa for this region. The trunk is ten feet in circumference at two feet six inches from the ground, and the tree is about fifty feet high and has a spread of thirty feet. A heavy gale took out more than half this tree some years ago. The new branches from the old wound are now sweeping the ground in much the same manner as do those of the sister tree, whose rooted branches cover an area of 300 square feet.

West Medford, Mass. *Henry Brooks.*

Foreign Correspondence.

London Letter.

CRINUMS.—The genus Crinum deserves to fill a much more important place amongst cultivated bulbous plants than it does now. Of the eighty or so species described fully forty are known to be in cultivation, and of these at least a score are possessed of characters sufficiently striking to find general favor. They are not as a rule difficult to cultivate; they flower freely, some species several times a year, whilst their flowers are large, handsome, and almost invariably sweet scented. In England the only representative collections of Crinums known to me are at Kew, and in the garden of Sir Charles Strickland, Baronet, at Malton, in Yorkshire. Sir Charles has made a specialty of Crinums and several other genera of *Amaryllidaceæ* for many years, cultivating them with conspicuous success, and carefully noting the peculiarities of each under

artificial treatment. He is consequently an authority on garden Crinums. Recognizing this, the Royal Horticultural Society invited him to read a paper on Crinums at the meeting held on Tuesday last. The paper was far too short, considering how little is known of Crinums by horticulturists generally. Still, it served to bring the plants into notice, the drawings of some of the rarest of the species cultivated by Sir Charles affording some idea of the character and ornament of the genus.

Dean Herbert was a keen admirer and grower of Crinums, as may be seen in his book on *Amaryllidaceæ*, wherein forty-six species are described, almost every one of which he appears to have had in cultivation. He also describes no less than twenty-three hybrid Crinums, the number being soon increased to thirty-two according to Sweet's "British Flower-Garden."

A very remarkable fact, and one which intending breeders of Crinums should make special note of, is the statement made by Herbert that "all the hybrid Crinums raised between *C. Capense* and the tropical species are hardy enough to stand out-of-doors against the front wall of a stove, where, if a mat is thrown over them in sharp frosts, they preserve much of their leaves through the winter, and from May to November continue throwing up a succession of flower-stems in great perfection." The only hybrid Crinum known in gardens now is *C. Powellii*, which was raised in England about fifteen years ago by crossing *C. Capense* and *C. Moorei*. The result of this cross was the production of at least two well marked varieties, one with pure white flowers, the other with exquisite pink flowers. This hybrid is perfectly hardy in England. It has handsome semi-erect foliage, stout flower-scapes, four to five

Fig. 68.—A Remarkable Old Catalpa-tree.—See page 536.

Herbert succeeded in making such crosses as *C. Zeylanicum* with *C. Capense*, *C. pedunculatum* with *C. Capense*, *C. scabium* with *C. Capense*, *C. rubescens* with *C. Capense*, *C. speciosum* with *C. defixum*, etc. He found that all Crinums, however dissimilar, readily intermix when brought together by human agency, and that it was only in cases of constitutional discrepancy, as, for instance, when a moisture-loving species was crossed with one which affected dry treatment, or a tropical species with one from cool regions, that the progeny of such crosses were not fertile. It is therefore surprising that not one of the hybrids mentioned by Herbert and Sweet are in cultivation now.

The first hybrid Amaryllid raised was *Hippeastrum Johnsoni* from *H. vittatum* and *H. regium*, and the second was *Crinum Goweni*, from *C. Capense* and *C. Zeylanicum*. This was raised by the Earl of Carnarvon at Highclere in 1813.

feet high, each bearing a bunch of from twelve to sixteen flowers, which are larger than those of the Belladonna Lily, and as elegant in form. The white variety has shorter scapes, but the flowers are fully as large as the pink ones, and they are of the purest white. Planted in a deep, well manured soil, in a sunny position, this Crinum increases rapidly. Mr. Gumbleton planted a single bulb which in seven years increased to about twelve, which pushed up eighteen scapes, averaging four feet in height, each bearing a huge bunch of beautiful flowers of the greatest value in the garden or when cut and placed in water. If some skilled cultivator and breeder would but take the Crinums in hand he would almost certainly produce the most valuable results in a comparatively short time. The material is at hand, its plasticity has been proved long ago by Herbert and others, whilst as an example of what may be expected we may point to the hybrid raised by Mr. Powell,

which is now admitted to be one of the most beautiful and stately bulbous plants known.

In the species themselves there is much that deserves admiration. There are thirty-five in cultivation at Kew, and of these only about one-fifth are what one would call difficult to manage. The easiest to grow and the most gigantic are among those species which do not lose their leaves annually and require plenty of water all the year round. *C. Asiaticum*, *C. defixum* and *C. pedunculatum* have large bulbs with very thick stem-like necks, leaves four feet long by from four to six inches in width standing out like the leaves of Fourcroyas. The individual flowers of these species are comparatively small, but they are borne in great numbers on stout, erect scapes; they are white with red tinged stamens, and are very fragrant. *C. angustum* and *C. amabile* are almost as large as the first named in leaf and habit, whilst their flowers are large, deep rosy red and deliciously scented. Then there is *C. giganteum*, an excellent plant for stove borders, flowering freely, the flowers pure white, six inches across, with broad, spreading segments. *C. Careyanum* is like it, while in *C. podophyllum* we have its dwarf representation. The large flowered *C. Zeylanicum*, *C. Kirkii*, *C. latifolium* and *C. scabrum* are as easy to cultivate as Eucharis, and their many flowered heads are common ornaments in the stoves at Kew. They have somewhat urceolate flowers six inches long by about four broad at the mouth, and they are white, more or less tinged or streaked with crimson.

Distinct from all the foregoing in the form of their flowers, which are erect, with tubes six inches long, narrow, long, radiating segments and anthers standing erect, are the species of the section called *Platyaster* by Baker. Of these we grow *C. Hildebrandtii*, white; *C. erubescens*, deep crimson; *C. Americanum*, *C. Commelyni*, *C. angustifolium*, all white; *C. amœnum*, and the rare *C. purpurascens*, from west tropical Africa. This last named is said to be almost wholly aquatic in its habits. We find it likes abundance of water and a tropical temperature; with these it grows very freely, sending out its long stolon-like suckers from the base of the bulb in every direction. *C. brachynema* has the most beautiful snow-white, waxy flowers, in umbels of about twenty on scapes a foot long; each flower is three inches across, the segments overlapping, as in the Zephyr flower, and the stamens only just showing above the narrow tube. If this species would but behave a little better under cultivation it would deserve to rank amongst the first half dozen stove bulbs. It is a native of Bombay, from whence it was introduced and flowered at Kew thirteen years ago. It has recently again been brought into prominent notice.

C. Moorei is one of the noblest of our greenhouse plants. Its stately scapes of large rosy flowers are scarcely ever absent from the conservatory in summer. Out-of-doors the common African species *C. Capense* (*longiflorum*) is quite at home, flowering and fruiting abundantly all the summer through.

Kew. *W. Watson.*

Cultural Department.

Rose Notes.

JEAN DUCHER is a pure Tea Rose, sent out in 1874, that notable year in our Rose calendar, which also gave us Perle des Jardins and Marie Guillot. Jean Ducher is one of those exquisitely colored Roses which captivate the eye at once, a soft, silvery salmon, with heart of glowing, rosy peach. It has not been sufficiently experimented with in our country to be thrown aside, though it must be confessed that under ordinary treatment it does not open its buds well with us. Its very attractive coloring should win for it a more careful trial.

Another beautiful Rose in this same line of rich coloring is Princess Beatrice (Tea), which proved such a lamentable failure as a forcing variety, but which, we believe, has never had a careful enough trial as a border Rose. Its foliage, habit and good constitution would all point to it as an ideal bedder, while its coloring is as unique as it is beautiful.

And speaking of fine bedders, probably no Rose is quite so perfect in this line as the lovely white Tea, Marie Guillot, mentioned above. So long as fine white Roses are as highly appreciated as at present this grand variety should be planted in profusion. Its flowers are very double and of a most beautiful clear white shade just touched with lemon, and very easily produced.

Ethel Brownlow (Tea) produces a bud and flower too small for popularity in our country; doubtless if it were carefully thinned out and only a few buds allowed to the plant, as is usual in England, it would make a better showing, as it certainly can be seen in fine form across the water; but with us it is a very slim, straggly grower.

Rubens (Tea) is an extremely fine white Rose, quite similar to its parent, Devoniensis, save that the bud is not quite so long as in that variety. It is more double, too, and a stronger grower; it can be found growing in many a garden under the label "Devoniensis," for it has been sent out in place of that variety in a great many cases, being so similar to it, and the dealer has doubtless excused himself by the thought that he was sending "something really better than was ordered." It is an early bloomer and a grand Rose in every way.

I am asked if there is any better white hybrid Perpetual than Merveille de Lyon. We believe it to be unsurpassed, though White Baroness is probably as good, and Mabel Morrison has only an occasional touch of color to mar its pure whiteness. These three white hybrid perpetuals and Baroness Rothschild (pink) are so absolutely perfect in form and color and texture that they can never be outdone in these respects. But in our northern and western country they are next to useless as outdoor Roses, owing to their liability to attacks of what florists call Black Spot, a fungoid disease fearfully prevalent among Roses grown in the open air.

When a Rose begins to drop its leaves and shows brown spots on their surfaces, we know that the Black Fungus is present. Scientific investigation has proved that the tissue between the upper and lower surfaces of the leaf is the point attacked, hence the difficulty of applying any solution effectively. We believe that nine-tenths of all the failures in Rose-growing in the sections named are due to this scourge. With all our investigations and experiments no remedy has as yet been found that will successfully check its development in the open ground. Sudden changes in temperature, excess of moisture, or the lack of it, seem to cause its development. Like other insect or fungoid pests, it will doubtless run its course and disappear, and there are even now indications pointing in this direction. It is a very fortunate thing indeed that many of the hybrids are of strong enough constitution to be able to withstand its attacks, though the very finest varieties seem to succumb first, and were it not for the fact that this disease is pretty well under control in our greenhouses, we should no longer be able to show perfect blooms of Baroness, Merveille de Lyon or of their very aristocratic sisters.

We have been very glad to discover a rather new variety, quite as fine as the four referred to, not absolutely white, but very delicately tinted pink, which, so far, seems proof against black spot. This variety is Madame Joseph Desbois, sent out by Guillot in 1886, a strong, free-growing variety, carrying superb blooms, very fine in the open air.

Heinrich Schultheis (a cross between Mabel Morrison and E. Y. Teas) was sent out by Bennett in 1882, and is a grand Rose in every respect, a strong grower, bearing large, double, sweet flowers of a delicate rose shade. It should be much more extensively grown in our country.

Our Madame Georges Bruant, planted two years ago in the open ground, has been in fine condition during the season, and shows no signs of mildew. It bears its flowers in about four crops, the first bloom, of course, being the most profuse. We value this Rose highly, and think that as it becomes established it loses its liability to mildew. Its clusters of immense snow white flowers are very distinct and beautiful.

Richmond, Ind. *E. G. Hill.*

Notes on Shrubs.

THE common Dwarf Chestnut or Chinquapin (*Castanea pumila*) is a plant rarely met with in cultivation at the north, though it possesses qualities rendering it desirable both for ornament and utility. Its extreme northern limit of spontaneous growth is given as southern Pennsylvania and Ohio; but when transplanted to the region about Boston it is quite hardy and seems to find a climate well suited to its requirements as regards healthy growth, although it does not attain large size. Well established plants never show the least injury in the most severe winters here.

In its most favorable southern and south-western home the Chinquapin sometimes becomes a small tree and grows to a height of forty or forty-five feet, with a stem from one to two feet or more in diameter, so that its timber is of use for posts, fencing, or even for railroad ties. In sterile or exposed situations, or when it is brought north out of its natural habitat, it appears to be in about its best period of growth and development when from five to eight feet high, at which time the spread of the branches is usually greater than the height, as a number of stout stems usually arise from the same base at the root. The habit of growth of the plant is very similar to that

of our native Hazel-bushes, so well known in the north-eastern part of the continent, and hardy enough to be indigenous quite far north in Canada.

The branches of this little Chestnut are usually well covered with foliage of a rather light green color. The leaves are smooth, shining above, and covered with a smooth grayish down or tomentum beneath. In general contour they resemble those of the common Chestnut, but they are shorter, being only from three to five inches long, and they are less acutely pointed and are broader in proportion to the length. The yellowish white staminate blossoms appear in much profusion at the nuts fall to the ground, and, if the atmosphere or ground is moist, they at once begin to germinate and put forth a radicle. Indeed, the propensity to germinate is so great that the nuts often sprout before they fall, and, as they do not long retain their vitality, they cannot be transported for planting in distant places unless packed in soil or other material which will prevent too fast drying. The difficulty of transporting the fresh seed while it retains its vitality has no doubt been a factor in preventing the wide and general dissemination which the plant seems to merit. The nuts, though small, are sweet and of good flavor, and the plants are quite prolific and usually bear

Fig. 69.—The Catalpa-tree (*Catalpa bignonoides*).—See page 536.

about the same time as those of the common Chestnut at the end of June or early in July, and at this time these Chestnut-shrubs present quite a pretty appearance when massed together. The blossoms are followed by the clusters of light green involucres, or "Chestnut-burs," which reach maturity about the 1st of October, when they open and disclose the smooth, shining, dark brown nuts.

The nuts of the common Chestnut are usually borne two or three in a bur; but those of the Chinquapin are produced singly, so that their sides are not flattened, and they are only about half the size of chestnuts. Soon after the involucres open freely every year. By care and selection larger and finer flavored nuts than the average might easily be obtained. It seems possible that this Dwarf Chestnut might thrive in higher latitudes than this, in places where the Chestnut-tree will not live, and especially in regions where winter snows are generally deep.

The Japanese *Photinia villosa*, which was figured in the first volume of GARDEN AND FOREST (page 67), is very handsome when in full fruit, although perhaps not more showy than some species of Hawthorns or of Crab Apples at this season. The serrated, stiff, thick, dark green leaves generally cover the

branches well, and the many-flowered corymbs of Hawthorn-like blossoms, which are produced in the first or second week of June, are quite showy. On well established plants the fruit is produced in corymbs, but it is often borne singly or not more than two or three together when the plants are young or in poor condition, or when the flowers have suffered injury. It does not ripen until the middle of October, when it turns to a shining deep red or scarlet color, and remains in a bright and showy condition for a considerable length of time. When fully ripe it is of a sweet and pleasant, though somewhat insipid, flavor. It is of an oblong shape and about a third of an inch in length, much resembling the drupe-like pomes of some of the Hawthorns. The fruit itself, however, is more like that of the Juneberry (Amelanchier), the pulp being granular, soft and of a yellowish color, containing commonly only one, but sometimes several, large, brown, thin-coated seeds, enclosed in a very thin and fragile core.

This is another fruit which might be made useful as food if selected and improved by cultivation.

The plant known as *Pourthiæa arguta*, from the Himalayas and other portions of Asia, which there is not sufficient good reason to separate from the genus Photinia, produces fruit having a very close resemblance to that of *Photinia villosa* in form, color, flavor and texture. It ripens at the same time, although the blossoms appear about a week earlier. The color of the fruit is perhaps of a clearer, brighter scarlet than that of *Photinia villosa*, but it has not as yet been produced so abundantly on plants here. The habit of the plant is much lighter and less stiff and rigid in foliage and limb. Both apparently become large shrubs or little trees, varying in habit according to circumstances like our native Shad-bush or Juneberry.

Arnold Arboretum. *J. G. J.*

Some Native Ferns.

OF the four or five Spleenworts native to New England which are useful for out-door culture, *Asplenium thelypteroides* is an important member. Its average height is about two and a half feet, and the fronds are six or eight inches wide and twice divided. Several of these nearly erect fronds come from a thick and usually forked root-stalk. It is often found in moist, shaded ravines growing with the narrow-leaved Spleenwort (*A. angustifolium*) and *Aspidium Goldianum*, but is more common than either of these. It is sometimes found in open sunlight, and in a soil which never becomes too dry it might be grown in the sun. It likes a rich, peaty soil which is always moist, but not too wet. In this it resembles many other Ferns that require constant moisture about their roots, but will not live in a wet place. The best time for transplanting is early spring, or in autumn if slightly protected the first winter. It may not make a good showing the first year, but it will soon become well established if placed in a suitable location.

Aspidium Boottii grows two feet high, with narrow fronds, on stems about half the length of the frond. It seems to grow in a peaty or boggy soil in thickets. Transplanted into a fine loam, with a mixture of peat added, it thrives finely. A heavy soil would not suit, nor would it stand a dry location. It needs shade, or partial shade, and may be transplanted in either spring or autumn.

We have in North America three species of Bladder Ferns, two of which are native to New England. Both of these are very useful for cultivation in certain localities and are among the easiest kinds to transplant. The larger *Cystopteris bulbifera*, which is common in shaded ravines, and also not rare under low shaded cliffs, is a graceful plant in midsummer, when the fronds are just matured. Its height is about two feet, and the fronds are only three or four inches wide near their base and taper to a point. But the fronds are not durable. They turn brown earlier in autumn than in most species. It propagates itself chiefly from little bulblets, which form on the back side of the rachis of the frond. These fall, take root and form new plants. A few plants set in a moist, shaded soil soon form a dense bed.

The other species, *C. fragilis*, is even more delicate and slender than the first. It is one of the first Ferns to start in spring, and its fronds die early. Even in August it is sometimes hard to find the roots, because the fronds have dried up so that they are scarcely visible. It is a common Fern on shaded cliffs and varies much. The fronds are oblong-lanceolate in shape, and grow from six to ten inches high. Both of these Ferns grow in tufts, several fronds to a plant, and have small roots for the size of their fronds. It is valuable for the rock-garden or for planting on cliffs.

The common Grape Fern, *Botrychium Virginicum*, may be found in almost any rich woods of New England. About half way up its stem the plant divides into two segments. One, a sterile frond, is sessile, somewhat triangular in outline, of a thin and delicate texture and three or four times divided. The other, which is the fertile portion, is long stalked, and is a close, narrow panicle or frond two or three inches long by an inch or so wide. When this fertile portion has just matured it makes a pretty plant. The two parts, though quite unlike, are both very handsome. But the fertile portion is of short duration. It soon sheds its spores and withers, and even the sterile frond, though lasting usually some time after the fertile one has decayed, is of much shorter duration than that of most Ferns, for by the last of August it has usually disappeared. It is an easy Fern to grow in any ordinary rich soil in the shade, and while it lasts is one of the handsomest.

Southwick, Mass. *F. H. Horsford.*

Autumn Crocuses.

THE Colchicums, usually known under this name, are too rarely seen in cultivation, as I was recently reminded by seeing in a Massachusetts garden beautiful clumps of the pure white variety of *C. autumnale*, covered with dense masses of snowy flowers. *C. autumnale* itself is of a pretty pale lilac purple, and contrasts well with the pure white variety. These plants are also known as Meadow Saffrons, owing to the fact that the anthers of the flowers of *C. sativus* furnish the Saffron of commerce. The roots also (which would appear at first sight to be bulbs, but are really corms), together with the seeds when dried, produce the drug known as Colchicum, which, though very poisonous, is a valuable medicine. *C. autumnale* is common in some parts of Britain. I well remember seeing it covering acres of meadow land with a pretty purple tinge in the autumn months, but it is probably exterminated there in that locality now, for an enterprising local firm were busy collecting the corms. Besides the two single-flowered forms of *C. autumnale* above noted, there are also double forms of both which are very beautiful, but also rare and seldom seen in catalogues, at least in America, where, indeed, it is not an easy matter to find Colchicums, for though I obtained not long ago a dozen bulbs of what were supposed to be the type, half of them proved to be white flowered.

C. speciosum is a very fine species, but so far as I can learn no one seems to have succeeded with it here in the eastern states. This plant is much larger than those already named, and of a crimson-purple color; it is, in fact, the largest of a very beautiful genus. I have never yet seen it in the bulb lists, so it is hard to find out whether it is possible to grow it or not. All the varieties of *C. autumnale* thrive well in a good, well drained soil, but should the soil be of a retentive nature they would require a liberal addition of sand. They would thrive admirably on rock-work, where they could push through other plants of a prostrate habit, for the Colchicums flower in fall; the leaves appear in spring, and about midsummer die off and the roots have a season of rest. Imported roots usually commence to flower on the voyage, and the flowers are very liable to get bruised. This, however, will only affect this season's flower; and they will probably start away all the stronger in spring for having been relieved from producing and maturing the quantity of flowers that each root produces when established.

South Lancaster, Mass. *E. O. Orpet.*

Vanda Sanderiana.

AMONG the fifty species of Vanda that are known to botanists *V. Sanderiana* may be considered as the king of them all in many respects. Perhaps it has a close rival for this honor in *V. Hookeriana*, a plant so completely distinct from it in every way that one might easily be pardoned for imagining that it did not belong to the same genus. Indeed, the question whether *V. Sanderiana* was not really an Arachnanthe or an Esmeralda instead of a Vanda has been broached; but as it is usually considered to belong to the latter genus I cannot do better than conform to the general opinion.

V. Sanderiana produces stems from one to four feet high, and these are furnished with distichous, narrow, strap-shaped, recurved leaves, leathery in texture, and more or less deeply and obliquely cut at the apex. Plants which possess remarkably pretty flowers do not always produce them so freely nor so often as one would like. This Vanda, however, when well grown flowers very freely. The strong, stout peduncles are developed from the axils of the leaves, and have been known to bear as many as a dozen flowers at a time. In September I saw a plant not more than nine inches high bearing eight flowers on a peduncle; and since the individual blooms often measure four and five inches across vertically, and almost the

same horizontally, one may imagine what a splendid spectacle a large spike of this species offers. One of the chief characteristics of the flowers, and one which has reminded many of the flowers of *Miltonia* (*Odontoglossum*) *vexillaria*, is that they are flat, the sepals and petals being almost in the same plane, the lip alone projecting. The upper sepal and the two petals are almost similar; the former, however, being larger. They are roundish oval in shape, of a soft pink or lilac color, and decorated at the base with crimson spots. But it is the two lower sepals which form the chief attraction of the flower. They are much larger than the other segments and broadly elliptic. The ground color is a soft creamy yellow, becoming more subdued toward the margins, and upon this there are from seven to nine broad red veins, half of which give off branches toward one edge and half toward the other, thus giving the whole a most charming appearance. The projecting front lobe of the lip is dark brownish red with three keels in the centre, while the ovate side lobes are greenish yellow speckled with red, and the short, thick column is of a bright, conspicuous yellow.

A variety known as Albata appeared about four years ago in the collection of Mr. W. Lee, of Downside. It has smaller flowers, with white upper sepal and petals, which are spotted with purple at the base, where the petals also have a sulphurous tinge. The lateral sepals are yellow, with a white margin, and reddish feathered veins.

Vanda Sanderiana itself has only been about seven years in cultivation, having been introduced in 1883 from the island of Mindanao (the largest of the Philippines) by the firm in honor of whose chief at St. Albans it received its name. So great was the sensation caused by its appearance that at the London salesrooms in October, 1883, as much as 200 guineas were willingly paid for a plant less than three feet across and bearing ninety leaves. And as evidence of the great esteem in which Sander's Vanda is still held, I may mention that in September of this year Sir Trevor Lawrence paid ninety guineas for a plant imported by the same firm. Mr. Lee, of Downside, who a few years ago possessed one of the finest collections of Orchids in the world, had the honor of being the first to flower this Vanda after its introduction.

Imported plants must be carefully treated at first in order to establish them. They should be put in a warm, moist house, spread out on the stage until the leaves and growths begin to "plump" a bit. Or they may be put in pots, with clean crocks around the roots, and receive an occasional syringing until the same effect is produced. When thoroughly established they should be put in a compost of peat and moss, with which may be mixed pieces of crocks and charcoal. In spring-time growth begins, and as it increases in vigor water must be given in proportionately larger quantities. The temperature during this period may range from sixty to eighty degrees Fahr., and the atmosphere should be laden with moisture. Abundance of light without exposing the plants directly to the sun is also necessary, as it not only accelerates the growth, but also ripens the plant. A short period of rest may be given the plants in winter, but they must not be permitted to get dry, and the temperature may vary from sixty to sixty-five degrees Fahr.

Isleworth, London. *John Weathers.*

Setting Strawberry Plants in Autumn.

ORDINARILY I have not advocated fall planting to any great extent, as spring-set plants generally succeed the best; but this season has been exceptional, and those who have planted early in this section are fortunate, judging from my own experience. Last spring the ground which I had intended for strawberries was in peas, and I set only a few plants of several varieties for stock, and my fruiting beds were turned under as soon as the crop was gathered. This left me to depend on fall-set plants for my strawberry-crop next season, and as soon as the peas were harvested the ground was prepared and ready for the plants before the plants were ready.

About the middle of August the ground was set with 500 plants of the newer varieties, and as they were lifted and transferred to their new quarters with a mass of soil attached to the roots so few of them felt the change that the loss was less than two per cent. Such plants, with their roots running through the soil in a natural way, are altogether superior to potted plants. These plants were set in rows two feet apart, and they have grown and thrown out such strong runners that, if left undisturbed, I believe they would have covered the entire surface of the ground before winter. Rains have been frequent, keeping the ground wet and cool—just the conditions needed for them—and they have improved the opportunity, and offer a better promise of a crop than I have ever seen in fall-set plants. By the middle of September the bed needed attention, but when the work should have been done the ground was too wet, and the plants were left to care for themselves while the grape harvest was gathered.

The bed has just been cleared up, the runners and surplus plants removed, and the prospect is fair that they will grow yet for some weeks. I estimate the gain in setting such plants from one's own grounds as fully fifty per cent. over plants brought from a distance whose roots are divested of soil. If persons who wish to follow peas or early potatoes with strawberries would adopt this plan of setting a few plants early in spring for stock, they can generally set their new beds much earlier than if they depend on buying their plants, can have better plants and better results, but, as stated at the outset, it must be remembered that this has been an exceptional season. With hot, dry autumns, as we sometimes have, the results would be far less satisfactory.

Earliness in setting in spring or fall is the keynote to success. Stock plants set early in spring before growth commences receive little or no check, and will furnish plants for fall setting much sooner than if planted later, and the earlier plants are set in July or August the more satisfactory will be the results. Dealers do not like to sell plants before September on account of the loss of young plants, and for this reason the price of fall plants should be double that of spring plants. I have another bed set between the 2d and 7th of September which has done fairly well; but just at that time we had a week of hot, dry weather, and the plants were checked, mainly because they could not be lifted with the earth adhering as in the former case.

Montclair, N. J. *E. Williams.*

Grapes in Eastern Massachusetts.

WE cultivate in our experimental collection fifty-five varieties of hardy Grapes, one vine of each, and in order, if possible, to ascertain the best varieties for family use, we have given them careful personal attention. The following, ripening in the order named, are the twelve most approved by my family: Lady, Moore's Early, Cottage, Eumelan, Worden, Wilder, Barry, Brighton, Massasoit, Lindley, Prentiss and Iona.

Lady Washington, Jefferson and many others are good, but only ripen when the growing season is longer than the average. We are located on the highest land in the city, eighty feet above sea level, with grounds protected by a six-foot, tight board fence on north, west and south, also on the north by a belt of Fir and Pine-trees. Up to the present time, October 20th, there has been no frost in our grounds. Three weeks since it appeared in the valley 500 feet north of us.

We prefer a wire trellis running north and south, with posts ten to fifteen feet apart, six feet high, and carrying five courses of wire, about equal distance apart, stretched horizontally and fastened to the posts. The vines are set eight to ten feet apart in rows eight feet apart. Although they are hardy, in our changing climate we find they do better if laid down after pruning in November and covered with earth. The fan-system of training, and the spur-system of pruning, we consider most satisfactory. The limited area of our grounds, being a city lot, made it necessary to utilize every foot of land. It is under-drained and subsoiled. The only fertilizers we have used are cow-manure, ground bone and wood ashes.

Cambridge, Mass. *Benjamin G. Smith.*

A Dangerous Enemy to the Radish.

A LARGE grower of Radishes in Piscataway, New Jersey, tells me that he will be forced to give up raising this crop. His favorite sort is a mammoth white. Half of the crop or more has been ruined this season. Before the roots are a quarter of their marketable size they turn black in spots, where they shrink and often crack. An expert can go through the rows and identify the diseased roots by the peculiar yellow color of the foliage. A microscopic examination of the diseased places on the roots reveals the traces of the same Fungus, or one very closely related to it, which causes the "club-root" of the Cabbage and the "knot-root" of the Turnip. All three of these host-plants belong to the same natural order (*Cruciferæ*); and it is not surprising to meet with this Fungus in the roots of the Radish. Several complaints have come to the station of fields of Cabbage ruined by the "club-root." This is so named because the Fungus of a very low order causes the Cabbage root-system to become a mass of irregular, misshapen warts and knots. With the Turnip the root is more fleshy, and the opportunity for distortions is not so great. Under the microscope there are no filaments to be seen, and therefore this Fungus differs from nearly all others which prey

upon plants. About all that can be seen is a cell of the root tissue, here and there, packed full of very minute spores. In the Radish the dark portions of the flesh, which is somewhat mottled or marbled, are close around the spore-bearing cells.

It is a well known fact that when this Plasmodophora once gets into the soil it remains for some time, and it is not safe to grow Cabbages soon again upon infested land. In case of the Radish failure it is probably true that the land was first "seeded down" with the Fungus spores which were produced in Cabbage, as that is the plant most frequently infested with it. The land in question has long been a truck-farm, and Cabbage is one of the leading crops.

These Fungi that thrive under ground upon the roots of plants are not easy to reach with remedies. The only practicable way seems to be the abandonment of the plants subject to the attack, and in a few seasons the germs will starve to death.

Rutgers College. *Byron D. Halsted.*

Adlumia cirrhosa.—This interesting and delicate plant, known by the common name of Climbing Fumitory, is hardy in this section and westward. It is biennial, and in favorable spots sows its own seed, and thus can be treated as a perennial. For covering bowers, trellises, etc., it is admirable, as, catching with its slender young leaf-stalks upon anything it can fasten to, it soon covers a shrub or trellis with its delicate foliage. It is sometimes called Allegheny Vine, and erroneously Mountain Fringe, as it is found in wet woods and delights in shade and moisture, although it will grow in open places. I find it most useful when treated as an annual, as it has no appearance of a vine or tendency to climb during its first year, while its thrice-pinnate leaves and delicate leaflets have the appearance of a Maidenhair Fern, although of a lighter color. It is of rapid growth, and most useful for decoration in the place of these Ferns where they cannot be had. It lasts longer in a cut state than the Fern. Early in the second season it starts its climbing growth, with little to remind one of its appearance the first year. It is then of little use for cutting, and where plants are required for this purpose it will be necessary to sow the seed early every year and thin out or transplant the seedlings, giving each plant room in which to develop.

Dongan Hills, Staten Island. *W. T.*

Correspondence.

The Palms of the Southern California Border.

To the Editor of Garden and Forest:

Sir,—The identity of the Washingtonias which grow on both sides of the southern boundary of California is somewhat uncertain. Those of the cañons of Lower California and those of the desert on our own side of the line have both been supposed to be *W. filifera*. This species was described from plants raised in Europe from seed whose source was not definitely stated. Long after a second species, *W. robusta*, was described in the same way, the seed being said to come from California. No native tree has yet been found which could be referred to this species. It has even been suggested that it was a mere gardener's variety, a view which finds some support in the insufficient characters assigned to the species.

Mr. Watson, however, who has seen both of these Palms at Herrenhausen, and has them in cultivation in the Botanic Garden at Cambridge, is inclined to consider them distinct, and his opinion is certainly entitled to great weight.

The question then recurs as to the true habitat of *W. robusta*. Mr. Watson has learned that the original source from which European seedsmen were supplied with seed of Washingtonia was the Cantilles cañon in Lower California, while later, and a few years before *W. robusta* was proposed by Wendland, collectors began to obtain their seed from the more accessible groves in the desert south of San Bernardino. From these facts he suggests in a recent contribution (*Pro. Am. Acad.*, xxv., 136) that the Palms of the former place may be the true *W. filifera*, while those of the latter may be *W. robusta*.

Should this supposition prove true *W. robusta* would be the proper name for the only Palm known to grow within the limits of the state of California. It cannot be accepted, however, until a careful study and comparison of the trees of the two regions shall have been made by some competent botanist, which may be rather hoped than expected.

Mr. Watson and other writers call the California tree the "Palm of San Bernardino County." In point of fact, not a single indigenous Palm is known to grow in that county. They are entirely confined to San Diego County. The error is a trifling one, but may be corrected in the interest of accuracy.

San Bernardino, Cal. *Samuel B. Parish.*

The Quality of Russian Apples.

To the Editor of Garden and Forest:

Sir.—As my friend, Dr. Hoskins, of Vermont, has objected, through the columns of your paper, to my opinion of the Russian Apples expressed at a meeting of the Pomological Society at Lewiston, Maine, last month, perhaps I ought to say that no one has a more sincere desire for the success of the Russian fruits in the northern part of the United States than myself; but it certainly is my duty to express my honest convictions, especially when called upon by direct question as at that meeting. It would be both unfair and unwise to pronounce any judgment that was not based on positive knowledge, or to give utterance to "a hasty and immature opinion." I have known some of the varieties mentioned, such as Oldenburg, Red Astrachan and Alexander, since my childhood, and I am free to say I rarely ate one from the very fact that there were so many other varieties that suited my taste much better. No doubt if I had lived in northern Vermont, or some other region where the choicer varieties of the Apple do not succeed, I should have relished even a half ripened Red Astrachan.

That Russian varieties are grown in many of the orchards in the true Apple-growing region is a fact, but it is also true they are grown to a very limited extent, except in the north. Who plants an orchard of any of these varieties elsewhere?

When I speak of the Apples in question I can say practically the same of all the Russian varieties with which I am acquainted, and I have had the opportunity of testing at least thirty or forty of the varieties most prized; nor has this judgment been formed in the office alone, where samples of them are almost daily received during the fall. From the meeting in Maine I went directly to the home of Dr. Hoskins at Newport, Vermont, and I was greatly pleased with what I saw of Russian apples in his orchard. Trees of some of the newer Russian varieties were heavily loaded with fruit of handsome appearance and fair quality, although none of them would rank as dessert apples with Primate, Jonathan, Grimes' Golden, Hubbardston and many others with which nearly every pomologist is acquainted. But it is only fair to say that in the same orchard trees of Wealthy, Iowa Russet, Magog, Red Streak, Scott's Winter and other American varieties were loaded equally well, while in quality the fruit excelled that of Russian varieties.

I have no prejudice against Russian apples, and so far as the extreme north is concerned, I now say they are superior to most American kinds in the matter of hardiness. But from northern Iowa I have lately received fourteen native varieties of winter Apples from one man; all are seedlings of fair quality and good size and appearance. From Wisconsin and Minnesota there have also come apples of good quality and some that will keep until late in the spring. It is winter apples that the north now needs most. Dr. Hoskins has sent me specimens of his apples this fall, and I was much pleased with the appearance of them, but I did not find them of superior quality. Nearly all of them were very light, not heavier than Fameuse, and greatly lacking in saccharine matter, although they would be good for cooking purposes. Prolific Sweeting, which I saw bearing abundantly in Dr. Hoskins' orchard, is very pleasantly flavored, but not so rich as many of the sweet apples; however, it is to be commended in the north on account of its hardiness.

When specimens are received in this office they are not cut on sight, but such as are not mature are kept until they are ready for testing. It is no doubt true that the locality in which the varieties are grown has considerable influence on their quality. A Ben Davis grown in Maine is about worthless, as I have had ample opportunity to judge, while the same variety grown in Arkansas is large, handsome and fairly well flavored. It would be unfair to compare any variety with Ben Davis in Maine, because it is not suited to that locality; and it would be equally unfair to compare any variety suitable to the north to a Ben Davis grown in Arkansas.

The cooking qualities of an apple are important, as Dr. Hoskins says; but if we can get an apple that is rich in saccharine matter there is usually no reason why it will not cook as well as one which is "thin" and needs sugar added to give the sauce richness. An apple is no richer for having been cooked, although it may be more palatable. If a Hubbardston or Esopus apple were cooked and compared with a Red Astrachan and Alexander the difference in quality would be as clearly perceived as it was before cooking; and the difference in the amount of sugar needed in each case would be marked.

Department of Agriculture, Washington. *H. E. Van Deman.*

Periodical Literature.

The October issue of the *Bulletin of Miscellaneous Information*, issued by the authorities of the Royal Gardens at Kew, contains an article on a forest-plague in Bavaria, where the Pine forests are injured by caterpillar of a moth (*Lipparis Monacha*). It appears that these caterpillars have attacked the forests of central Europe at different times during the last 200 years. They make their appearance after long intervals, but the destruction which they cause is serious. In Bavaria alone it is estimated that the loss to the revenue from woods and forests will amount next year to $200,000, and in some of the forests attacked by the "nonnen," as the pest is known there, the excreta from caterpillars is said to lie six inches deep. The following note from the Bavarian Forest Administration on this subject is reproduced from the Bulletin:

"The Forest Department of the Ministry of Finance state that the 'nonne' plague is now extended over nearly all Bavaria south of the Danube in scattered tracts. The infested districts are estimated at about 22,000 acres. The fertility of the insect is so great, and its numbers so enormous, that the Forest Department fear that no measures of destruction are of any avail. 'We stand powerless before the immensity of the pest.' The insect attacks chiefly the Pine and Fir, with which Bavarian forests abound, but in default of these it does not despise the Beech, Oak and other forest-trees, and is even known to feed on shrubs and garden plants. It never attacks Corn or Wheat, and, curious to say, there is one tree, the Horse-chestnut, which it will not touch.

"The means of destruction are various. Forest-bonfires of worthless wood form an easy means within reach of all communes. The insects are attracted by the fire and are smothered in the smoke, but only a comparatively small number are killed. Children and boys are also sent out to destroy the insects. From September to April the eggs can be found in the bark and destroyed, and in April the very young caterpillars can be more easily killed; all these, however, are mere partial measures. The only efficient general measure seems to be the cutting down of whole forests when much infested, in which case the remedy is almost worse than the disease. One other method is used by the state, but not within reach of communes, and therefore not described in the official pamphlet. A large electric light is placed in the forest by night. It attracts hundreds of thousands of 'nonnen' to the mouth of a large funnel through which a rapid exhaust current of air is forced, sucking the insects by thousands into a hole under the earth, where they are buried. Even this is only a partial measure, for in a forest containing perhaps a hundred millions of 'nonnen' it is not much to destroy 200,000 or 300,000.

"The Forest Department consequently fear an even greater extension of the plague next year, and an even worse danger is threatened—namely, that of the 'bark beetle,' which, burrowing under the bark, is much more injurious to the wood and more difficult to kill. It is always found that where the forests are injured by any special cause the 'bark beetle' follows and attacks the injured or diseased wood in vast numbers, and this is greatly feared will be the case in 1891. Great numbers of trees are being felled, but to avoid flooding the market with timber and causing a ruinous fall in prices, contracts and agreements have been entered into with neighboring forest-owners and the large timber-dealers by which only certain quantities will be sold at a time, and prices will be maintained. The yearly 'cut' in the other Bavarian forests has also been much reduced."

The following account of the "nonne" is translated from the Bulletin for the *Münchener Neueste Nachrichten:*

"Just as men and beasts are from time to time carried off in multitudes by epidemics, which epidemics it has not yet been found possible entirely and finally to suppress by art and science, and by doctors and veterinaries, in like manner the trees of the foreest are now and then attacked and destroyed by forest-insects. Fortunately these vanish, as a rule, as quickly as they come, by the operation of natural agencies. This is the only consolation we have in view of the desolate condition to which many of the Pine forests of Germany, and in particular of Bavaria, have been reduced by the horrible devouring caterpillar, the 'nonne.'

"Before now in earlier centuries our woods have been attacked by similar calamities, and yet the German forests grow green and thrive, and yield, year by year, higher rents. This may serve to calm too anxious minds and to correct the views of those who are so ready with their judgments, and who ascribe the blame of the misfortunes which have fallen on the forests solely to the forest-officials.

"However, the present visitation has nothing particular to do with the forest-training nor the new forest-organization, nor with the style of forest-husbandry in vogue, nor with the aims of modern woodcraft, for it is well known that destruction by insect plagues occurred hundreds of years ago, and therefore at a time when the trees grew of themselves in primeval fashion, and there was no question of forest-training nor of any particular forest-husbandry. Besides this, the fact is not in dispute that the destructions caused by insects are much less intense in forests of mingled broad-leaved and needle-leaved trees; but this money-loving world unfortunately insists on quick-growing Pine forests instead of safe slow-growing woods."

The report here gives a brief account of seventeen of these insect invasions with their dates, which occurred between the middle of the fifteenth and the beginning of the present century. Of these visitations the last one, which raged in the Pine and Fir forests of Lobenstein, Schleiz, Ebersdorf and Saalburg from 1794 to 1797, worked vast destruction, so that the loss was reckoned at 2,000,000 cords of wood. "Bechstein, in his Forest-Insectology (1818), describes the great destruction caused by the 'nonne' caterpillar in 1794-97 in Vogtland, Lithuania and west Russia, and gives figures which correspond exactly with our present situation. Seventy-two years ago he wrote as follows:

"'It is horrible to travel in districts where these caterpillars swarm. Many thousands crawl up and down the trees. One cannot take a step without treading on a number of them. There is a perpetual rain of their excreta, which often lies six inches deep, and being dissolved by the rain, collects in puddles, which diffuse a pestilential stench. One can form no idea of the magnitude and terrible nature of the destruction. Fortunately, Nature herself stopped the pest through a kind of dysentery which attacked the caterpillars in the beginning of June, 1797. This deadly sickness was attributed to a kind of mildew. The caterpillars collected together in great thick clumps four to six inches across, the excreta became pale, the intestines dirty, and so they died, leaving behind them a disgusting stench.'

"As to the measures of prevention and suppression of that day, they hardly differed from those in use now. Bechstein, in 1818, recommended, first, protection and encouragement of insectivorous birds; second, protection of useful insects which attack and pursue the "nonnen"; third, scraping the eggs off the trees with brooms and scrapers with long and short stems; fourth, picking off the moths, caterpillars and cocoons (in 1796 the Prussian district administration at Hof caused 1,838,000 female butterflies to be caught, and paid six kreutzers for every thousand); fifth, the lighting of a number of small bonfires on dark nights (for it is well known that butterflies are attracted by the moonlight), and they paid in Bayreuth in 1796 for one night's maintenance of fire and bringing wood five groschen; sixth, isolation of the districts attacked by broad paths and ditches; seventh, cutting off in March and April of the branches nearly to the vertical and burning them; eighth, cutting down of whole standing trees, and burning of the branches and bark; ninth, removal of moss and litter from the forests and burning, if eggs or caterpillars are found therein.

"In connection with the injury caused by the 'nonnen' in this century, we may briefly mention here the extensive plague of 1839 and 1840 in upper Suabia (Würtemberg), which ravaged many hundreds of 'morgens' of Pine forest. The same thing was repeated in 1855, and at the present moment is appearing almost in the same spots in a very serious manner. But the most considerable 'nonnen' pest of all took place in Russia, and spread from 1845 to 1868 in a most devastating manner over Poland, Lithuania and east Prussia. The invasion in east Prussia began suddenly in 1853, in the night of July 29th–30th, and covered a superficies of about sixty German square miles in the administration of Gumbinnen, after it had already crossed over in 1851 and 1852 the southern boundary of the administration of Königsberg. At that time the moths were driven by a storm into the sea while on their way, so that the insects were thrown by the waves upon the coasts for a distance of ten German miles in a bank seven feet wide and six inches thick, and were used as manure by the coast inhabitants. The extent of the ravages in Russia at that time was 6,400 German geographical square miles, and in east Prussia 600, making a total of 7,000 miles. At the very least, 55,000,000 Prussian cords of wood, or 185,000,000 cubic yards of wood, became the prey of 'nonnen' and bark beetles.

"The examples given suffice to show that the 'nonnen' have made their appearance in former centuries in large numbers, and have generally disappeared with equal suddenness. The present catastrophe will likewise come to an end after causing heavy losses, though it may possibly return many

years later. But we possess no radical remedy against the caterpillar, and it seems doubtful if we shall ever find one. At all events, it is the duty of the forest-managers, forest-owners, the Government and the whole population to come to close quarters in every possible way with this dangerous visitor, even although Nature herself up till now has proved the best helper, and may continue so in future."

Notes.

Spiræa prunifolia is less desirable than many other shrubs of this genus, but its autumn coloring is remarkably vivid. This year it has been conspicuous for the bright crimson of its foliage.

A writer in *Gartenflora* says that a few sprigs of Rosemary laid among woolen clothes will effectually protect them from moths. New expedients for this purpose are worth trying, now that the price of camphor has risen so greatly.

The western range of the Hemlock has been still farther extended, a tree having been lately found by Mr. J. F. Bartlett, of Brainard, Minnesota, on the right or east bank of the outlet of Pokegema Lake, that is, near the north line of Section 15, Township 55, Range 26, west, in Minnesota, and seventy-five miles north-east of the intersection of the Wisconsin line with the St. Louis River.

We have received from the Minister of Agriculture and Commerce of Italy a copy of the "Annuario Generale della Orticultura in Italia" for the current year, a directory of the horticultural societies of the kingdom and their members, of the botanic gardens and schools of agriculture and forestry, with some cultural memoranda relating to new plants and other information of special interest to Italian botanists, gardeners and foresters.

In connection with the interesting notes on "Grapes in Eastern Massachusetts," which appear in another column of this issue, it may be well to state that the method of cultivation practiced by Mr. Smith seems to be justified by the results attained. At the exhibition of the Massachusetts Horticultural Society last month he obtained the first prize for Grapes of the following varieties: Wilder, Barry, Prentiss, Massasoit, Lindley and Brighton.

Experiments at the Iowa Agricultural Experiment Station seem to indicate that lime, added to mixtures of London purple and Paris green, greatly lessens the injury which these poisons inflict upon the foliage of trees sprayed with them. About a bushel of lime is put in a barrel and covered with water until it is thoroughly slaked. The mixture is stirred until it is very milky, and as much is added to the arsenical preparations as can be used without clogging the sprayer.

In the valuable article on American Grapes, by Mr. T. V. Munson, which appeared in the issue of this journal for October 1st, the name *Vitis palmata* was used to designate the plant called *V. rubra* by Mr. Munson. This change was for the sake of uniformity, as the plant had been figured and described as *V. palmata* in Garden and Forest (vol. ii., p. 340). It should have been stated that the change was not authorized by Mr. Munson, and that he prefers the name *V. rubra*, which he has used in other publications.

The Chrysanthemum Show of the Philadelphia Horticultural Society, which is to be held next week, beginning on the evening of Monday, November 10th, and continuing until Friday evening, bids fair to equal the best of the Philadelphia exhibitions in former years. The entries have been numerous, and the display of new seedlings will be unusually large. Exceptional interest is manifested in the award of a special premium of fifty dollars offered by a member of the Society for the best seedling Chrysanthemum, no one being allowed to compete except the veteran growers, John Thorpe, of Pearl River, New York, and W. K. Harris, of Philadelphia.

The New York Forest Commission will hold a meeting on November 5th, at eleven A. M., at the office of Sherman W. Knevals, Esq., 32 Nassau Street, New York, for the especial purpose of discussing the establishment of an Adirondack State Park, in pursuance of the resolution passed by the Legislature of 1890. In order to avail themselves of the opinions and suggestions of all parties interested, the Commissioners invite representatives from all clubs, preserves, sanitariums and other associations now existing in the Adirondack region, to meet with them for the purpose of mutual consultation and informal discussion.

A correspondent of the *Gardeners' Chronicle* recently wrote: "I have to-day flowered a *Cattleya aurea* that has two flowers to the spike; one is distinctly *C. Dowiana*, with the purple on the sepals and the gold veins on the lip distinct to the very edge; the other flower is *C. aurea* without any purple markings on the sepals or petals, and the gold veins at the sides of the lip widening until the purple disappears. I mention this to show how absurd the naming of slight varieties of Orchids is. I have been flowering some of the best looking *C. Dowiana* I ever saw, but have not been fortunate enough to find a single Hardyana among them. From experiments I have made I am convinced that a clear light has much to do with the intensity of the coloring of these Cattleyas; and some whose petals are mottled with rose or purple when suspended close to the glass in a good light will have no red coloring on the petals if kept in a shady place."

Monsieur Lemoine, of Nancy, sends us a colored plate of another series of four of his new hybrid Gladioli. There are two of the Nanceianus hybrids: Le Grand Carnot, with very large bright, orange-scarlet flowers, with conspicuous, sulphur colored spots on two of the lower segments and shaded with purple toward the interior; Harry Veitch, with dark maroon-red flowers, the lower divisions marked with straw colored and bright red spots. Two new hybrids of the Lemoinei section complete the group. They are: Alice Wilson, with large, well-formed flowers with reflexed segments, displaying the interior, which is cream colored, slightly shaded with rose. Another of the same class is Nuée Bleue, with smaller, violet-blue flowers, marked with large, darker violet spots, separated through the middle by a yellow ray. Several more new Nanceianus hybrids are sent out this year from the Nancy nursery, including Dr. H. P. Wolcott, Kléber, Masséna, Undine, and Professor Sargent.

In an account of a conversation recently held with Colonel H. Gardner, the special agent of the Census Office for the collection of statistics with regard to viticulture, a correspondent of the New York *Sun* reports him as saying that "there are in round numbers 400,000 acres of land in this country planted to vineyards, of which 300,000 will be in bearing this year. This is an increase of 220,000 acres in vineyard area during the past ten years, and an increase of over $10,000,000 a year in the capital invested. Of the area of bearing vines in the country, California alone has 150,000 acres, including 25,000 acres of Raisin-grapes. That state also has of the total investment of capital nearly $78,000,000. Between 30,000,000 and 40,000,000 gallons of wine will be made in the United States this year, of which California will produce more than half. Seven-eighths of the grapes of California go to the wine press. Four-fifths of the grapes grown in all the rest of the United States are for table use. California alone grows the Raisin-grape."

Bulletin No. 12 of the United States Department of Agriculture is devoted to an account of the "Grasses of the Southwest," with plates and descriptions by Dr. George Vasey of the species peculiar to the desert region of western Texas, New Mexico, Arizona, and southern California. The region embraced in this work so far as the valleys are concerned is principally a desert. Grasses are scanty, not in variety of species, but in distribution. Some are short-lived, springing up after summer rains, maturing rapidly, and then disappearing. The perennial species grow generally in bunches, with roots which penetrate deep into the soil and thus enable them to withstand the effects of protracted drought. Grasses nowhere form a dense sod as they do in regions of more equally distributed rainfall. As Dr. Vasey points out in his introduction, the most important agricultural question before the people of this region is how to increase the production of Grasses and other forage plants. The Department of Agriculture is endeavoring to solve this problem by means of various experimental farms situated in different parts of the western and south-western parts of the country, and the sensible opinion seems to be gaining ground that if any Grasses can be profitably cultivated in this arid region it will be some of the native species, which naturally are better fitted to support the hardships of the peculiar climate than others developed under more favorable circumstances. The first step, naturally, in experiments with the native plants of a country is for the experimenter to learn something about them, and this he will be able to do by the aid of this work, which admirably accomplishes its purpose through the capital illustrations and Dr. Vasey's descriptions. Fifty plates are given in this first part, which are to be supplemented by fifty more, now in course of preparation. The plates are from drawings made chiefly by Mr. William R. Scholl.